

In re application of CABRERA ET AL.
Serial No. 09/361,641

REMARKS

The Office action has been carefully considered. Claims 49-89 were pending in the application. The Office action rejected claims 49-53, 56-60, 63-70, 72-78, 80-81, 83 and 85-89 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,924,102 to Perks et al ("Perks"). The Office action rejected claims 54-55, 61-62, 71, 79, 82 and 84 under 35 U.S.C. § 103(a) over Perks in view of U.S. Patent 5,469,573 to McGill, III et al ("McGill"). Applicants respectfully traverse these rejections.

Applicants thanks the Examiner for the interview held (by telephone) on June 2, 2004. During the interview, the Examiner and applicant's attorney discussed the claims with respect to the prior art. The essence of applicant's position is incorporated in the remarks below.

Applicants' technique is generally directed towards automatic backup and restoration of a failed system by capturing and storing the state of executing programs in addition to backing up the actual operating system and data files. Applicants' technique provides an application programming interface that a backup program may invoke for capturing the state of executing programs, including application programs. FIG. 2 illustrates a backup process 60 for invoking backup APIs 80 for collecting information on running programs/processes 82 and storing the state information in state files 62. Applicants' technique may provide a backup application programming interface for collecting information on programs and processes in use on the system and

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whose state is changing. See page 17 of the specification. The information of a program's execution state may be persistently stored on a medium along with the state of a hardware device such as a hard disk, catalog information of unmodifiable files, and registry information. It should be noted that other information may be collected in a similar manner, thereby extending the backup and restore capabilities. For example, some programs may have their own database of information and the backup APIs may similarly back up this information on a running system. See page 19 of the specification. Upon system failure, a recovery process may retrieve the previous state of the hard disk persistently stored and restore the hard disk state. The recovery process may then retrieve the information of a previous execution state of programs from persistent storage and restore the programs. FIG. 3 illustrates a restore process 70 for retrieving state information on running programs/processes in state files 62 for use by a restore program 100 for restoration of applications 66. Running the restore application program 100 is the counterpart of the program used to back up the applications 66. See page 29 of the specification. Advantageously, the application programming interface may be used by any third party developer for backing up application programs for restoration upon failure. Note that the above description is for example and informational purposes only, and should not be used to interpret the claims, which are discussed below.

Perks, in general, is very different from the present invention. First of all, Perks is directed to a system and method for managing critical files in an information handling system. Application programs may call an API to register

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and unregister critical files. Importantly, critical files are files that contain configuration data, setup information, or critical user data. Application executables are not considered critical files in Perks, nor does Perks disclose the concept of capturing and storing the state of executing programs as critical files. Perks distinguishes his invention from prior art methods that often back up only user data and do not back up configuration data. Perks' system manages and backs up critical files such as configuration files, setup files, and user data files, which are difficult to recover after a system crash. Nowhere in Perks does Perks suggest program execution information. Instead, Perks provides examples of initialization files and configuration files such as OS2SYS.INI, OS2.INI, CONFIG.SYS, AUTOEXEC.BAT, SYSTEM.DAT and USER.DAT. These are all conventional configuration, setup and user data files. As a further example, Perks also considers application-specific configuration and setup files as critical files. As an example, Perks includes .DOT files that store templates for Microsoft Word. As another example, Perks describes user data files such as for a financial application program. Nowhere does Perks disclose receiving information on the execution state of a program executing on the system. In fact, Perks teaches away from receiving information on the execution state of a program executing on the system by dismissing application executables as critical files.

In contrast to the claims of the present invention, Perks has simply no concept of storing the state of executing programs. Nor does Perks have any concept of providing application programming interface for capturing the state of

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executing programs as generally recited in applicants' claims. First, independent claim 49 recites the limitation of "invoking an application programming interface for collecting information of an execution state of a program." Applicants' technique may provide a backup application programming interface for collecting information on programs and processes in use on the system and whose state is changing. Perks does not disclose any such limitation, but is instead concerned with managing and backing up critical files such as configuration files, setup files, and user data files. Consistent with this stated purpose, Perks simply describes managing critical files in an information handling system whereby application programs may call an API to register and unregister critical files for backing up the critical files for later use during restoration of the computer system. Nowhere in Perks can there be found any discussion of providing an application programming interface for capturing software execution state.

Second, independent claim 66 of the present invention recites "representing information of the execution state of a program." Applicants' technique may collect information on programs and processes in use on the system and whose state is changing. Again, Perks does not disclose any such limitation. Rather, consistent with the stated purpose, Perks merely describes managing critical files in an information handling system whereby application programs may call an API to register and unregister critical files for backing up the critical files for later use during restoration of the computer system. Third, independent claim 76 recites "restoring the execution state of at least one program using the recorded recovery information of the execution state of the

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program". Applicants' technique further uses the information of the execution state of a programs and processes to restore a computer system after failure. Perks does not disclose the limitation of claim 76. Moreover, Perks does not describe any capability to retrieve information of a previous execution state of a program, nor could Perks without previously collecting information on programs and processes in use on the system including their execution state. Nowhere in Perks can there be found any discussion of capturing software execution state or retrieving such a captured software execution state.

McGill is also very different from the present invention. First of all, McGill is directed to a data backup and restoration technique for restoring a configured operating system without reloading and reconfiguring the operating system from its original distribution media. To do so, McGill describes backing up the configured operating system by copying the operating system loaded on a computer system to a first media or backup device and copying configuration-specific data files such as system configuration files and device drivers to a second media or bootable recovery diskette. The configured operating system may then be subsequently restored on the computer system by initializing the computer system from the bootable recovery diskette and using the system configuration files and device drivers stored on the recovery diskette to provide a temporary operating system for loading a recovery application program from the backup device that, in turn, loads the operating system, configuration files and device drivers from the backup device. After loading is complete, the computer

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system is reinitialized using the loaded operating system. Once the computer system is restarted, any other backed up files can be restored to the hard drive.

Like Perks, McGill has simply no concept of storing the state of executing programs. Nor does McGill have any concept of providing an application programming interface for capturing the state of executing programs as generally recited in applicants' claims. Rather McGill describes backing up the configured operating system by copying the operating system loaded on a computer system to a first media or backup device and copying configuration-specific data files such as system configuration files and device drivers to a second media or bootable recovery diskette. Nowhere in McGill can applicants find a description of storing the state of executing programs, nor can applicants find any concept of providing an application programming interface for capturing the state of executing programs as generally recited in applicants' claims.

For instance, independent claim 49 recites the limitation of "invoking an application programming interface for collecting information of an execution state of a program." Significantly, applicants' technique may provide a backup application programming interface for collecting information on programs and processes in use on the system and whose state is changing. McGill does not disclose any such limitation, but is instead concerned with restoring a configured operating system without reloading and reconfiguring the operating system from its original distribution media. Consistent with this stated purpose, McGill simply describes backing up the configured operating system by copying the operating system loaded on a computer system to a backup device and copying

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configuration-specific data files such as system configuration files and device drivers to a second media or bootable recovery diskette. Nowhere in McGill can there be found any discussion of providing an application programming interface for capturing software execution state.

As another example, independent claim 66 of the present invention recites "representing information of the execution state of a program." Applicants' technique may collect information on programs and processes in use on the system and whose state is changing. Again, McGill does not disclose any such limitation. Rather, consistent with the stated purpose, McGill merely describes backing up the configured operating system by copying the operating system loaded on a computer system to a backup device so that it may be restored without reloading and reconfiguring the operating system from its original distribution media. Moreover, independent claim 76 recites "restoring the execution state of the at least one program using the recorded recovery information of the execution state of the program". Applicants' technique further uses the information of the execution state of a programs and processes to restore the environment of a computer system after failure. McGill does not disclose the limitation of claim 76. Moreover, McGill does not describe any capability to retrieve information of a previous execution state of a program, nor could McGill without previously collecting information on programs and processes in use on the system including their execution state. Nowhere in McGill can there be found any discussion of capturing software execution state or retrieving such a captured software execution state.

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For at least these significant reasons, applicants submit that the claims are patentable over the prior art of record, including Perks and McGill, whether considered alone or in any permissible combination.

Further, by law, in order to modify a reference to reject claimed subject matter, there must be some teaching or suggestion outside of applicants' teachings to do so. Neither Perks nor McGill have any such teachings or suggestions as to any such modification, let alone any teaching or suggestion as to how either system could be modified, or why it might be desirable to do so. In specific, the motivation described by Perks for his technique is to manage and back up critical files such as configuration files, setup files, and user data files, which are difficult to recover after a system crash. Perks distinguishes his invention from prior art methods that often back up only user data and do not back up configuration data. Importantly, critical files are files that contain configuration data, setup information, or critical user data. Application executables are not considered critical files in Perks, nor does Perks disclose the concept of capturing and storing the state of executing programs as critical files. In fact, Perks teaches away from receiving information on the execution state of a program executing on the system by dismissing application executables as critical files. Nor does McGill offer any motivation for modifying his invention to reach applicants' claims. The motivation described by McGill for his technique is to restore a configured operating system without reloading and reconfiguring the operating system from its original distribution media. The only other use McGill contemplates for his technique is for efficient factory loading of a fully configured

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operating system and application software into similarly configured workstations on a production line (McGill, column 2, lines 6-17.) Thus, McGill offers no motivation for modifying his invention to reach applicants' recited limitations of "providing an application programming interface for capturing software execution state," or for "receiving information of the execution state of at least one program executing on the system." Thus, the only way in which Perks or McGill could be modified to reach applicants' claimed invention is via applicants' own teachings, which is impermissible by law.

For at least these additional reasons, applicants submit that the claims are patentable over the prior art of record, including Perks and McGill, whether considered alone or in any permissible combination.

Regarding the dependent claims, applicants respectfully submit that dependent claims 50-65, 67-75 and 77-89, by similar analysis, are not anticipated by Perks or McGill, whether considered alone or in any permissible combination. Each of the dependent claims 50-65 includes the limitation of "invoking an application programming interface for collecting information of an execution state of a program." Each of the dependent claims 67-75 includes the limitation of "representing information of the execution state of a program." And each of the dependent claims 77-89 includes the limitation of "restoring the execution state of the at least one program using the recorded recovery information of the execution state of the program." In addition to the limitations noted above, each of these dependent claims includes additional patentable

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elements. For at least these reasons, applicants submit that all of the dependent claims are in condition for allowance.

The Office action has also objected to claim 66 because the computer readable medium claim is not structured to specifically associate the executable program instructions with the functions being performed, such that there is no doubt that the instructions performing these functions are stored on the computer readable medium. Applicants respectfully disagree with this objection.

Applicants respectfully submit that claim 66 is directed toward a computer-readable medium having stored thereon a data structure and is limited to a practical application. MPEP § 2106(IV)(B)(1a) specifically states that "a claimed computer readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the medium which permit the data structure's functionality to be realized, and is thus statutory." In contrast, MPEP § 2106(IV)(B)(1a) considers "[d]ata structures not claimed as embodied in computer-readable media are descriptive material per se and are not statutory because they are not capable of causing functional change in the computer." By organizing a data structure with the claimed sets of data on a computer readable medium, structural and functional interrelationships between the data structure and the medium, which permit the data structure's functionality to be realized, are defined and are thus statutory. Applicants respectfully submit that no correction is required.

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Conclusion

In view of the foregoing remarks, it is respectfully submitted that claims 49-89 of the present application are patentable over the prior art of record, and that the application is in good and proper form for allowance. A favorable action on the part of the Examiner is earnestly solicited.

If in the opinion of the Examiner a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney at (425) 836-3030.

Respectfully submitted,



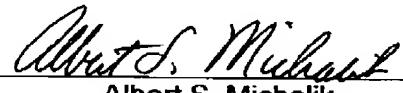
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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this Amendment, along with transmittal, petition for extension of time and facsimile cover sheet, are being transmitted by facsimile to the United States Patent and Trademark Office in accordance with 37 C.F.R. 1.6(d) on the date shown below:

Date: July 9, 2004



Albert S. Michalik

2820 Amendment

2130 Second Amendment after RCE